CLAIMS

1. A method for selecting a value of one or more parameters of a timer function for use by a receiver for delaying feedback in a multicast system, the method comprising:

finding the one or more parameter values which minimise an expression defined as a function of the parameters, the expression comprising at least two terms, where one term relates to the expected number of feedback messages generated by receivers in the multicast system and the second term relates to the expected extra latency of the feedback due to the timer function.

2. A method for selecting a timer function for use by a receiver for delaying feedback in a multicast system, the method comprising the steps of:

for each of at least two timer functions, minimising with respect to one or more parameters of the timer function an expression comprising at least two terms, where one term relates to the expected number of feedback messages generated by receivers in the multicast system and the second term relates to the expected extra latency of the feedback due to the timer function; and

comparing the values of the minimized expressions for the timer functions.

3. A method according to claim 1 or 2, where the expression further comprises a third term for weighting relatively the first and second terms.

4. A method according to any preceding claim, where the second term has the form of a function having a maximum gradient corresponding to the extra latency $E[M]$ being substantially equal to a predefined maximum accepable extra latency.

5. A method according to claim 4, where the second term has the form of a monotonic function increasing with $E[M]$.

6. A method according to any preceding claim, where the second term has the form:

$$\Theta(E[M]) = 1 - \frac{1}{1 + \exp(\gamma(E[M] - E^0[M]))}$$

in which $E[M]$ expresses the expected extra latency as a function of the timer function, and $E^0[M]$ is the maximum acceptable extra latency.

7. A method of multicast transmission, comprising performing the method according to any preceding claim, and including within a multicast message the values of one or more parameters for the timer function and/or an indication of a selected timer function.

8. A method of multicast transmission according to claim 7, further comprising the steps of:

monitoring multicast conditions during multicast transmission;

in the event that the conditions change in a predefined way, repeating the method defined in any of claims 1 to 6; and

sending the recalculated values of one or more parameters and/or indication of a selected timer function in a subsequent multicast message.

9. A method according to claim 8, where the multicast conditions comprise the size of the group of receivers.

10. A method of multicast transmission, comprising:

repeatedly performing the method according to any of claims 1 to 6 for varying input multicast conditions in order to select a value of one or more parameters and/or timer function associated with the input multicast conditions, where the expression is defined as a function of at least one input multicast condition;

storing the selected parameter values and/or an indication of a selected timer function in a lookup table together with an associated input multicast condition;

a sender transmitting multicast messages including values of one or more parameters and/or an indication of a selected timer function which have been

extracted from the lookup table with reference to the associated multicast condition.

11. A method of multicast transmission according to claim 10, further comprising the steps of:

monitoring multicast conditions during multicast transmission;

in the event that the conditions change in a predefined way, extracting information associated with the changed multicast conditions from the lookup table, the information comprising values of one or more parameters and/or an indication of a selected timer function; and

sending a subsequent multicast message including the extracted information.

12. A method according to any preceding claim in which a timer function is a shifted power-law (SPL) distribution function of the form:

$$f_{SPL}(t) = \begin{cases} \frac{b}{T} + (1-b)\frac{a}{T}\left(\frac{t}{T}\right)^{a-1} & ;\ 0 \le t \le T \\ 0 & ;\ otherwise \end{cases}$$

in which both a and b are parameters and T is the timer period.

13. A storage medium carrying computer readable code representing instructions for causing a computer to perform the method according to any preceding claim when the instructions are executed by the computer.

14. A computer data signal embodied in a carrier wave and representing instructions for causing a computer to perform the method according to any of claims 1 to 10 when the instructions are executed by the computer.

15. A storage medium or data signal according to claim 11 or 12, where the instructions are also for generating a user interface via which a user can input one or more timer functions.

16. A storage medium or data signal according to any of claims 11 to 13, where the instructions are also for generating a user interface via which a user can input one or more of: information indicating the value of the weighting term; the maximum acceptable extra delay; an estimate of the size of a group of receivers; an estimate of the maximum transmission time between the sender and receivers.

17. Apparatus for performing the method according to any of claims 1 to 12.

18. A multicast transmission system comprising apparatus according to claim 17.

19. A multicast sender for operating as part of the multicast transmission system defined in claim 18.

20. A multicast receiver for operating as part of the multicast transmission system defined in claim 18.

21. A method or apparatus for selecting a value of one or more parameters of a timer function for use in a multicast feedback mechanism substantially as hereinbefore described with reference to and/or substantially as illustrated in any one or any combination of the accompanying drawings.

22. A method or apparatus for selecting a timer function for use in a multicast feedback mechanism substantially as hereinbefore described with reference to and/or substantially as illustrated in any one or any combination of the accompanying drawings.

23. A method or apparatus for multicast transmission substantially as hereinbefore described with reference to and/or substantially as illustrated in any one or any combination of the accompanying drawings.